

**Response**

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Serial No.: 10/049,665

Confirmation No.: 4705

Filed: 11 April 2002

For: METHOD FOR PRODUCING A DENTAL PROSTHESIS

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**Remarks**

The Office Action mailed 13 July 2006 has been received and reviewed. No claims having been added, amended, or canceled herein, the pending claims are claims 17-21 and 34-39.

Reconsideration and withdrawal of the rejections are respectfully requested in view of the following remarks.

**Rejections under 35 U.S.C. §103**

The Examiner rejected claims 17-18, 20-21, and 34-39 under 35 U.S.C. §103(a) as being unpatentable over Hintersehr (U.S. Patent No. 5,702,650) in view of Filser et al. (All Ceramic Dental Bridges, pages 165-189). This rejection is respectfully traversed.

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure." M.P.E.P. §706.02(j).

**The Presently Claimed Invention**

The present claims recite a process for preparing a denture. The process includes:  
a) preparing a blank comprising a presintered material, b) rough processing the blank by milling, c) fine processing the rough processed blank by milling, d) dense sintering the fine processed blank in a temperature range from 1200 to 1650°C, the blank comprising the pre-sintered material having a raw breaking resistance from 15 to 28 MPa.

Notably the present specification describes the importance of the pre-sintered material having a raw breaking resistance from 15 to 28 MPa:

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Customary raw breaking resistances known from the state of the art for ceramic dental blanks are in the higher strength range, for example from 75 to 110 MPa; such blanks cannot be used for the invention.

It was found that the processing of pre-sintered blanks, the raw breaking resistance of which lies outside the range according to the invention, does not lead to useable results. In the case of lower raw breaking resistances, the resulting blanks are too soft, and can fracture during milling, whereas in the case of higher raw breaking resistances the resulting blanks are too hard, and neither can be processed with the normal processing procedures.

(Page 4, lines 7-16 of the present specification).

Hintersehr

Hintersehr "concerns a process for producing dental prostheses out of ceramic materials" (column 1, lines 12-13). Hintersehr recognizes several problems with using ceramic materials in dental prosthetics:

Up to now ceramic materials have not been used extensively in dental prosthetics, although ceramic prostheses should be characterized by high strengths. . . . Two essential reasons are responsible for this, i.e., the *dense vitrification* or infiltration required, with the resulting *difficulties in working the material* and the requirement for biocompatibility, that is, body compatibility of the ceramic. Dental prostheses have to be made accurate with respect to shape and mass so that they can fulfill their specified purpose. It would not be possible to make ceramic prostheses accurate with respect to shape and mass if they were porous, i.e., comparatively soft. In this condition, tolerances comparable to those of metal prostheses may be obtained. However, porous ceramic dental prostheses are unusable. In every case, *they have to be densely vitrified* or infiltrated so that they assume the properties with which they are technically and aesthetically superior to metal dental prostheses. However, dense

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vitrification and infiltration change the shape and mass accuracies obtained in the porous condition, so that *a densely vitrified ceramic dental prosthesis would have to be refinished in a second manufacturing step. . . . However, densely vitrified or infiltrated ceramic parts assume such hardnesses and strengths that a reworking of objectively complex-shaped, small and very small parts of very high precision, such as dental prostheses, is very difficult, if not excluded.*" (column 1, lines 36-66; emphasis added).

As a solution to one of the problems (e.g., difficulties in working a densely vitrified material), Hintersehr discloses a process that includes "working the unfinished piece to form a dental prosthesis by means of a rotating tool having a circumference and being made of metal-bonded diamond grains with speeds of revolution for the tool of 10,000 to 50,000 revolutions per minute, with a first movement of the tool towards the piece of 0.1 to 0.5 millimeters per minute, and a second movement of the tool perpendicular to the first movement of 0.3 to 3.0 centimeters per second, and rotational speed along the circumference of the tool of 0.5 to 9.0 m/sec" (claim 1), wherein "the unfinished piece is densely vitrified" (claim 2).

As an aside, Hintersehr indicates that "[a]lso, in accordance with the invention, it is possible to start first from a porous unfinished piece, rework this into a prosthesis making allowances in dimensioning, and then to finish to the final shape and mass by means of the process invented" (column 3, lines 4-8). Thus, although Hintersehr states that a material that is not densely vitrified (e.g., porous unfinished piece) can be reworked into a prosthesis, he implies that dense vitrification of the ceramic dental prosthesis would require refinishing in a second manufacturing step, which could be done using his disclosed process.

As acknowledged by the Examiner, "Hintersehr is silent disclosing the raw breaking resistance of the pre-sintered material" (page 2, middle paragraph, of the Office Action mailed 13 July 2006). In fact, absent the quotation noted in the above paragraph, Hintersehr lacks any description of a pre-sintered material identified as being capable of being reworked into a prosthesis, much less the raw breaking resistance of the presintered material or the processing conditions to make such a presintered material.

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Nonetheless, the Examiner asserted that "the composition of the presintered material of Hintersehr meets the claimed composition as recited in instant claim 34. Hence, a person of ordinary skill, at the time the invention was made, would reasonably deem the claimed raw breaking resistance as shared mechanical property by Hintersehr." (Page 2, middle paragraph, of the Office Action mailed 13 July 2006). Applicants earnestly disagree.

Applicants respectfully submit that the raw breaking resistance of the blank is a result not only of its composition, but also of the presintering processing conditions (e.g., time and temperature profile). *See, for example*, the present specification at, for example, page 7, lines 1-5; page 9, lines 14-18; and page 11, line 21 to page 12, line 2. As noted above, Hintersehr lacks any disclosure or suggestion of processing conditions to make a presintered material as recited in the present claims.

Finally, the Examiner acknowledged that "Hintersehr is also silent in rough and fine milling of the presintered material" (page 2, last paragraph, of the Office Action mailed 13 July 2006), and attempted to combine Filser et al. with Hintersehr to correct this deficiency.

*Filser et al.*

The Examiner asserted that Filser et al. "teaches of rough and fine milling of the presintered material prior to fully sintering the material at a temperature of 1500°C" (page 2, last paragraph, of the Office Action mailed 13 July 2006).

Applicants respectfully submit that Filser et al. fail to correct the deficiencies of Hintersehr noted herein for at least the following reason. Even if Filser et al. arguably teaches rough and fine milling of a presintered material as alleged by the Examiner, ***Filser et al. fails to disclose or suggest the raw breaking resistance of the pre-sintered material.***

Thus, neither Hintersehr nor Filser et al., either alone or in combination, teach all the language of the presently rejected claims.

Morover, Applicants respectfully submit that neither Hintersehr nor Filser et al. suggests the desirability of their combination. Applicants respectfully submit that the Examiner's

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allegation that Hintersehr and Filser et al. can be combined (page 3, first paragraph, of the Office Action mailed 13 July 2006) is insufficient to support a *prima facie* case of obviousness, absent the suggestion of the desirability of the combination in the prior art. *See, for example*, M.P.E.P. §2143.01(III), which directs that "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination."

For at least the reasons discussed herein above, Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness under 35 U.S.C. §103(a) for claims 17-18, 20-21, and 34-39 being unpatentable over Hintersehr in view of Filser et al.

The Examiner rejected claim 19 under 35 U.S.C. §103(a) as being unpatentable over Hintersehr (U.S. Patent No. 5,702,650) in view of Filser et al. (All Ceramic Dental Bridges, pages 165-189) and in further view of Filser (All Ceramic Dental Bridge slide presentation). This rejection is respectfully traversed.

Claim 19 depends from claim 17 or claim 18. The deficiencies of Hintersehr in view of Filser et al. as applied to claims 17 and 18 have been discussed herein above. Amongst other deficiencies, neither Hintersehr nor Filser et al. disclose or suggest the raw breaking resistance of the pre-sintered material. Thus, Applicants respectfully submit that Filser fails to provide that which is missing from Hintersehr in view of Filser et al.

For at least this reason, Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness under 35 U.S.C. §103(a) for claim 19 being unpatentable over Hintersehr in view of Filser et al., and further in view of Filser.

In view of the remarks presented herein, reconsideration and withdrawal of the rejections under 35 U.S.C. §103(a) are respectfully requested.

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**Information Disclosure Statement**

Applicants thank the Examiner for bringing to their attention the fact that the Examiner is of the opinion that art of record in copending application Serial No. 10/468,071 might be of interest in the present application. To satisfy the duty of candor and good faith, Applicants are submitting herewith an Information Disclosure Statement including art of record in copending application Serial No. 10/468,071.

**Summary**

It is respectfully submitted that all the pending claims are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted

By

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October 13, 2006

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**CERTIFICATE UNDER 37 CFR §1.10:**"Express Mail" mailing label number: EV 073 686 593 USDate of Deposit: October 13, 2006

I hereby certify that the Transmittal Letter and the paper(s) and/or fee(s), as described hereinabove, are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR §1.10 on the date indicated above and is addressed to: **Mail Stop Amendment**, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

By: Name: Rachel Gagliardi

(LARGE ENTITY TRANSMITTAL UNDER RULE 1.10)